

REMARKS

Claims 1-19 are all the claims currently pending in the application after the entry of the foregoing amendments. Claims 16-19 are newly added via this Amendment.

35 U.S.C. §103:

Claims 1-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hornbeck (U.S. Patent 6,323,982) in view of Giebel et al. (U.S. Patent 6,206,209).

The Examiner maintains substantially the same position that he asserted in the Office Action dated November 29, 2002. Applicants do not feel that the Examiner has sufficiently rebutted the previously submitted arguments; thus, Applicants again emphasize the lack of motivation to combine the references as asserted by the Examiner. In particular, Applicants traverse the rejection based on the following comments.

The present invention is drawn to a uniquely designed micro-mirror device for an image display apparatus, which has a physical configuration such that the claimed mirror is pivoted toward sides of the claimed landing pad. As described in the specification, this results in a reduction of optical loss in comparison to the prior art.

Hornbeck discloses a micro-mirror device having mirrors that pivot toward corners of a substrate 304, as shown in Fig. 4. The Examiner acknowledges that Hornbeck does not show a mirror that is pivoted toward sides of a landing pad. (See page 4, first full paragraph of the Office Action.)

Giebel discloses a light scanning system used for reading a barcode. As shown in Fig. 1 of Giebel, light is projected from element 4, reflected by element 2, again reflected by element 6, and then after being re-reflected by element 2, it is detected by element 8.

Because Hornbeck does not teach a mirror used in an image display device that pivots toward sides of a landing pad, the Examiner proposes combining the rotating mirror in Giebel with that of Hornbeck in an effort to teach the claimed invention.

The Examiner's alleged motivation for combining Giebel with Hornbeck is based on a quote in Giebel that reads "[t]he packaged scan element is designed for wafer scale assembly, which significantly reduces the device costs." As one skilled in the art would appreciate, wafer scale assembly is the production of many components on one wafer in an effort to increase efficiency and lower the cost of packaging. The cost is reduced because of the particular aspects of wafer scale assembly. Thus, as one skilled in the art would also appreciate after reading Giebel, a miniature light beam scanner can be made in a cost-effective manner by using wafer scale assembly.

However, and importantly, there is **no disclosed connection between the reduced "device cost" and the manner in which the mirror pivots in Giebel.** Instead, it is clear that the reduced cost is based on the principle of wafer scale assembly, which is independent of the particular pivoting design aspects of the light scanner.

At best, one may have tried to produce the device of Hornbeck using a "wafer scale assembly," but would not have been motivated to rearrange the physical structure of Hornbeck based on the teachings of using "wafer scale assembly." Moreover, because of the disclosed

design in Hornbeck, it would be physically impossible to pivot the mirror of Hornbeck toward sides of the landing pad, as in the present invention. This is because there is no electrostatic attraction that would cause such a rotation of the mirror in Hornbeck.

As shown in Fig. 4 of Hornbeck, pivoting of the mirror toward sides of the alleged landing pad (312) is physically impossible. Any sort of attempt to have the mirror in Hornbeck pivot towards sides (verses corners) of the alleged landing pad would require a substantial reconstruction and redesign of the elements of Hornbeck, none of which are taught or suggested. As noted in MPEP §2143.01, under the title of "THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE," the Courts have noted that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959). The Court made this assertion because the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." *Id.* at 813.

Accordingly, Applicants submit that the rejection made by the Examiner fails to make obvious the claimed invention because 1) there is no motivation to combine the references as asserted by the Examiner; and 2) the proposed modification would change the principle of operation of the primary reference in such a way that a substantial reconstruction and redesign would be needed, which results in the proposed combination being insufficient to support a *prima facie*

case of obviousness. Thus, Applicants request the Examiner to withdraw the rejection of claims 1-15 under 35 U.S.C. §103(a).

Moreover, Applicants point out that the Examiner has not properly addressed the elements of at least dependent claims 3 and 6. For example, Hornbeck does not teach a support plate having connections that protrude from sides of the support plate, and a pair of springs, as recited in claims 3 and 6. The Examiner relies on elements 114, 116, 120 and 122 for an alleged teaching of this feature, but does not specifically point to which element he is applying against the claimed features. It appears that he is applying element 114 against the claimed support plate. This feature fails to teach the claimed support plate because there are no connecting portions which “protrude” from sides of the support plate and which are “connected to” the recited pair of springs. It also appears that the Examiner is applying elements 120 against the claimed springs, but these elements do not connect an upper surface of the recited first posts to the connecting portions. If anything, the alleged springs 120 are connected to a portion of the alleged support plate 114 in an area that is recessed, and not an area that protrudes.

Furthermore, the Examiner has not sufficiently shown how the applied references teach the features of claim 5 regarding the first posts having a height that is lower than a height of the second post. In an effort to address this feature, the Examiner makes reference to a dielectric layer 328 that prevents adhesive contact with a pair of base electrodes. (See the second full paragraph on page 6 of the Office Action.) This disclosure does not teach or suggest the features of claim 5 regarding the height of the first posts and the second posts.

Applicants also amend method claim 13 to further define the invention. In particular, claim 13 is amended to describe movement of the spring members.

NEW CLAIMS:

Applicants add new claims 16-19 that further define the invention. New claims 16 and 18 describe the movement direction of the spring members, and claims 17 and 19 describe an axis of rotation around which the mirrors pivot. These claims are allowable at least by virtue of their dependency on independent claims 1 and 10, in addition to their individual recitations.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. SERIAL NO. 09/725,959

ART UNIT 2673
Q61266

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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PATENT TRADEMARK OFFICE

Date: July 2, 2003

APPENDIX

IN THE CLAIMS:

Please amend the claims as follows:

13. (Amended) A method of reflecting light using a micro-mirror device in an image display apparatus, comprising:

supplying a driving voltage to at least one of a pair of base electrodes of the micro-mirror device;

creating an electrostatic attraction between the at least one of the pair of the base electrodes and a mirror, wherein the mirror is pivottally supported by a pair of spring members so as to be pivoted around an axis formed in a lengthwise direction of the pair of base electrodes such that one of the spring members is forced in a direction opposite a direction of the other of the spring members when the mirror is pivoted; and

altering the driving voltage which is supplied to the at least one of the pair of base electrodes so that a reflection angle of light incident upon the mirror is controlled.

Claims 16-19 are added as new claims.